

Midrange Computing Working Group

Process and Goals



Defining the Future of Scientific Computing Resources at Berkeley Lab

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- Phase I:
 - Assessment and Findings
 - Recommendations for a path forward
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 - The MRC Workshop

Alessandra Ciocio – Physics

MRC Workshop – March 26, 2002

Background



Summer 2000

The Laboratory's Computing and Communications Services Advisory committee (CSAC) started discussions on Midrange Computing at LBNL

- The extension of the NERSC-LBNL-DOE midrange computing agreement

- An MOU between NERSC, LBNL, and DOE, was established (for the 3 previous years) by leveraging NERSC T3E investments and support services
- LBNL researchers benefited, in a very cost-effective way, from the access to one of the most advanced high performance computers
- CSAC recommended the renewal of the agreement with NERSC and considered extending the agreement beyond the T3E to include the new supercomputer

- The need for midrange computing at LBNL

- The only midrange computing resource currently at LBNL had limits and shortcomings:
 - a) It was strictly limited to parallel programming applications and therefore met only part of the high-end scientific computing needs at LBNL
 - b) The usage of the facility was strictly limited and not expandable by LBNL
- This put LBNL scientists at a disadvantage while requiring such computing resources
- It appeared to be a need for scalable LBNL lab-wide midrange computing resources that could considerably help the laboratory to move forward in its science

→ CSAC recommended the development of a strategic plan for midrange computing at LBNL independent and (initially) in addition to the NERSC-LBNL-DOE agreement

The MRC Working Group



Fall 2000:

Members of **CSAC** (scientific divisions) formed the Midrange Computing Working Group

January 2001:

The MRC working group became a partnership between **CSAC** and the Information Technology Services Division (**ITSD**) to actively assess the feasibility of enhanced midrange scientific computing at the Laboratory.

CSAC

Paul Adams	Physical Biosciences
Ali Belkacem	Chemical Sciences
Alessandra Ciocio	Physics (<i>chair</i>)
Ken Downing	Life Sciences
Doug Olson	Nuclear Science
John Staples	Accelerator and Fusion Research
Shaheen Tonse	Environmental Energy Technologies
Michel Van Hove	Materials Sciences
Tammy Welcome	NERSC

ITSD

Sandy Merola (Division Director)
Jim Leighton
Gary Jung
Jon Bashor (CS)
Yeen Mankin (CS)
Erik Richman (TEID)

Phase I: Assessments and Findings



September 2001

An Institutional Scientific Midrange Computing Resource for Berkeley Lab

A report compiled by the Midrange Computing (MRC) Working Group

- This report represented the culmination of the first stage of the group's work
- Investigated whether an institutional midrange computing resource would be appropriate and/or sustainable for Berkeley Lab
- Identified various options for implementing an institutional midrange computing resource
- Identified related financial considerations
- The need to initiate discussions of such a resource with senior Lab management and the pool of potential users at the Laboratory
- Those discussions, together with the information already collected, to determine the appropriate path forward

Appendices:

- LBNL Use of Scientific Computing Resources
- Midrange Computing Budget Estimates
- A Survey of Midrange Computing Resources at Other Labs

<http://www-atlas.lbl.gov/~ciocio/CSAC/MRC/Reports/>

Recommendations for a path forward



Along with the Report, the MRC WG made its recommendation to ITSD for a path forward:

- **The goal**
 - To assess the feasibility of enhanced midrange scientific computing at the Laboratory
- **The findings**
 - How midrange computing has been and is being done at LBNL
 - What, if any, midrange computing resources are available to scientists at other DOE laboratories
 - Possible financial models for supporting such a resource
- **Critical issues**
 - Usefulness
 - Commitment
- **Conclusions and recommendations for a path forward**
 - The initial assessment indicated that there is enough interest in the Laboratory for a MRC resource
 - However, the MRC WG didn't assess the level of commitment that would warrant the viability of such a resource

Recommendation for:

- **A one-on-one contact with potential midrange computing users and scientist currently using small cluster machines**
- **A workshop that would bring together users to define the need and the level of commitment**
- Should also involve computer architecture expert to assess system requirements and a viable financial model
- If there is sufficient interest, a procurement process and a sustainable financial model would be finalized

Phase II



The MRC WG continued to follow the evolving situation of scientific computing at Berkeley Lab and to identify a number of options for institutional support of midrange computing for the Lab's scientific programs

Facts:

- Growing number of small clusters at LBNL acquired by groups in various divisions
- There is a Lab-wide need for MRC

Question:

What can be done to make the growing midrange computing at LBNL a consistent success across the whole Laboratory?

The MRC Survey



A Survey of current and potential midrange computing users within the various divisions was then conducted to help determine the institutional requirements for MRC and/or support services

- The results of the survey should facilitate the discussion at this Workshop
- Might reaffirm the status quo or might suggest one of a number of coordinated approaches

The MRC Workshop



- To bring together current and potential MRC users
- For a discussion of MRC users requirements and needs
- For a discussion of options and identified offerings

With the hope that this workshop will help evaluate and determine the best path forward for Scientific Computing at Berkeley Lab